

## Beryllium—what it is, why we use it and what it does to our bodies

*Editor's note: This is a special edition devoted to exploring issues concerning beryllium. Questions you may have about beryllium will be answered in this publication. Current personal protection equipment and handling techniques also will be discussed, as well as technology for the future handling of beryllium at Y-12.*

*First, some basic facts:*

### **What is beryllium?**

Beryllium is a silver-gray metallic element that occurs naturally in some 30 minerals.

### **When was it discovered?**

Beryllium was discovered in 1798, but it was not widely used in industry until the 1940s and 1950s.

### **Why do we use beryllium?**

Beryllium is the second lightest of the metals (only a third as heavy as aluminum). It is about six times stiffer than steel and can withstand great force before bending. Beryllium has a high melting point and can hold its shape over a wide temperature range. It also has a high heat-absorption capacity. Other attributes of the metal are a nonmagnetic quality, dimensional stability, good corrosion resistance, lowest thermal neutron absorption cross-section of any metal, and high transparency to X-rays. It also can be machined to close tolerances.

### **What are the negative points of using beryllium?**

Beryllium is expensive and too brittle to work with in some applications. The most significant disadvantage of using beryllium as an industrial material is the potential toxicity of its dust, fumes and soluble salts. Unless ventilation and other controls are used, small particles and chips of insoluble beryllium-containing materials break off during machining and other processes and spread through the air in the work area. Inhalation of these tiny particles could lead to beryllium sensitivity and chronic beryllium disease.

### **What is the difference between beryllium sensitivity and chronic beryllium disease?**

Beryllium sensitization is when the immune system has the ability to recognize beryllium as a foreign substance, and it initiates a biological defense. Epidemiological evidence suggests that two to five percent of the population has the necessary genetic code to initiate such a response to beryllium. Five percent of Y-12's population is approximately 225 people. Beryllium sensitivity is not an illness or an injury.

Chronic beryllium disease usually manifests in the lungs. It results in attempts by the immune system to repel and eliminate

beryllium from tissues, which results in collateral damage that destroys normal lung tissue followed by scar tissue development.

### **Can anyone get chronic beryllium disease (CBD)?**

Exposure to beryllium particles can cause CBD in certain people. Not all people who are exposed to beryllium will get CBD.

About one to three percent of all people exposed to beryllium develop CBD. In studies of people in certain occupations where exposure to beryllium was historically greatest (for example, studies of machinists in beryllium operations), this number rises to as many as 10 to 14 percent.

There currently is no widely available test to determine who is sensitive to beryllium before exposure occurs.

### **What are the long-term health effects of beryllium?**

Long-term, or chronic, health effects can take years to develop, if at all, after the first exposure to beryllium and can affect people who were exposed to very small amounts of beryllium. In some cases, CBD has been

diagnosed in former office workers and others who had only brief, incidental exposure to beryllium.

CBD primarily is a lung disease, but, in rare instances, it has been known to affect other organs, particularly the lymph nodes, skin, spleen, liver, kidneys and heart.

The average time from first beryllium exposure to the development of symptoms is 10 to 15 years. This means a person can be exposed to beryllium today and not suffer any health effects for decades. Health effects have appeared in some people a few months after exposure but other people have taken as long as 30 years to show symptoms.

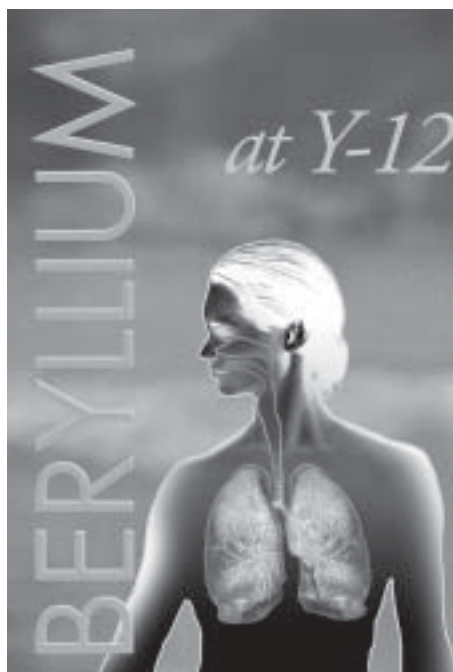
### **What are the symptoms of CBD?**

Symptoms of CBD may include the following:

- persistent coughing,
- shortness of breath with physical exertion,
- fatigue,
- chest and joint pain,
- blood in the sputum,
- rapid heart rate,
- loss of appetite and
- fevers and night sweats.

### **Is there a cure for CBD?**

No. CBD is treatable, but not curable.



**Want to know more? Visit**  
DOE's Chronic Beryllium Disease Prevention Web page at <http://tis-nt.eh.doe.gov/be/webdoc1.html-ssi>

## Keeping the Y-12 work force safe from beryllium hazards



Y-12 always has placed a major emphasis on safety. Staff in the Industrial Hygiene Organization (IH), however, never relent in their pursuit of a safer workplace and work force. This especially is true as it relates to beryllium.

Beryllium has been a part of Y-12's operations since it

opened more than 50 years ago. At the same time, programs were implemented to monitor work with this and other unique metals. Close monitoring of beryllium led to a wealth of new knowledge about the substance and its effects on humans.

While questions remain, it is clear that precautions must be taken when working with beryllium. In fact, when the proper precautions are in place, working with this metal can present minimal risks. Recognition, evaluation and control of the hazard are key for IH staff to do their jobs effectively.

One of the first steps that IH takes when evaluating a project involving beryllium is to seek alternative materials that will achieve the same outcome. If no adequate substitutes are available, a multidisciplinary group, including a task worker, is formed to identify and plan for appropriate precautions. Typical components of such a plan include engineering controls (physically separating people from the material through a glovebox or enclosure, isolation, proper ventilation etc.), administrative controls (work plans, training) and personal

### Uses of beryllium

Additive to glass, ceramic and plastic  
Aircraft engines and brakes  
Brass alloys  
Camera shutters  
Dental prostheses  
Electrical relays  
Golf clubs  
Gyroscopes  
Microelectronics  
Microwave devices  
Military vehicle armor  
Mirrors  
Missile guidance systems  
Nonsparking tools  
Nuclear reactors  
Pen clips  
Personal computers  
Precision instruments  
Rockets  
Satellites  
Springs  
Space technology material  
Submarine cable housing  
Transistor mountings  
Wheels  
X-ray tubes

**Source:** Environmental Health Perspectives Journal

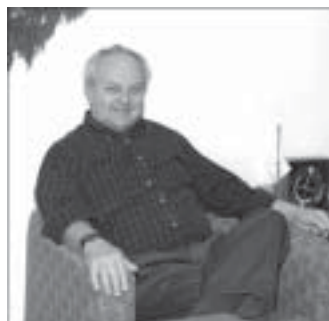
protective equipment (which always is available to employees, whether prescribed or by voluntary request). This process basically is Integrated Safety Management—defining the scope of work, identifying hazards and mitigating them. When the planning process is complete, the finished product is a Beryllium Work Plan.

IH is conservative when dealing with beryllium, using action levels ten times more stringent than Occupational Safety and Health Administration permissible exposure limits. In fact, many aspects of the Y-12 chronic beryllium disease prevention program go beyond DOE requirements, such as exposure monitoring, training, beryllium work plans and control of low-risk operations. A 1999 DOE audit highlighted parts of the Y-12 program as a model for the complex.

The IH team also takes samples to ensure that Y-12 is a safe place to work. IH takes an average of 600 personal-breathing-zone air samples per month. Further protection of employees is achieved through the characterization of buildings with potential beryllium contamination. Before employees recently moved into Alpha 3, IH took 1,692 surface and air samples in that building alone. This sampling program helps ensure that control measures in place are effective in preventing personnel exposure to beryllium.

If employees have questions concerning beryllium in the workplace, there are a number of avenues they can pursue. Medical questions associated with beryllium should be addressed to the Occupational Medical Services Clinic (574-1577). Additional resources include Tom Ford, IH Manager (576-7182) and Jim Jenkins, Beryllium Program Lead (576-7180).

## Mitchell discusses his experiences with beryllium



Mitchell

BWXT Y-12 President and General Manager John Mitchell recently discussed his experiences working with beryllium. Here is what he had to say:

**Q: We understand that you have had experience in a beryllium area. Can you tell us a little more about it?**

**A:** During the 1960s, I worked in the aerospace industry. In particular, I worked at a manufacturing plant where we machined several thou-

sand large beryllium components over a period of years. I did not perform any hands-on operations, but I was often in and out of the area where manufacturing was going on. I complied with all safety regulations in force at the time, and I was trained in the health issues related to beryllium as they were known at that time.

**Q: Have you ever been tested for beryllium sensitivity? If not, have you ever thought about being tested?**

**A:** No—not until now—and I will talk to Dr. Wehrly to get his advice!

# Technological changes help eliminate exposure to material hazards

A significant part of modernizing Y-12 is the use of new or advanced technologies and engineered controls to reduce or eliminate potential exposure of employees to hazardous materials.

One hazardous material used at Y-12 is beryllium oxide, which can pose significant health risks.

The rapid transfer port (RTP) is a technological innovation being explored that should make the handling of materials such as beryllium oxide both more efficient and safer. This technology will be a key piece of the new Special Materials Capability (SMC) currently being developed.

The RTP will support material transfer between beryllium oxide process steps. It also can be used to move both material and tooling.

Lisa Stinton, project manager for the Beryllium Manufacturing Facility, said the RTP concept is important for Y-12. "As we progress with the design of the Beryllium Manufacturing Facility, we will be developing designs that incorporate the RTP concept. We want to protect workers to the maximum extent possible by creating engineered barriers between the workers and the material."

Resembling a docking port from a spacecraft, the RTP is a sealable stainless-steel chamber on a heavy-duty wheeled cart that docks and locks onto the side of specially-built gloveboxes.

Once the port is docked, which seals the door on the glovebox to the one on the outside of the RTP container, the RTP can be opened and the material removed from the chamber and placed inside the glovebox without ever leaving containment.

The door surfaces form a unit that is sealed together and not in contact with any possibly contaminated environment. The RTP should eliminate the need for personal protective equipment during this material transfer. Testing will be performed this summer to validate the design.

Sam Robinson of Y-12 Technology Development said the

RTP could eliminate a complicated and time-consuming bagging and sealing process for the movement of beryllium oxide in the manufacturing process.

"As we move through the processing, we are double-bagging and sealing material and then unsealing and unbagging at the next process. The new technology will eliminate all those steps."

"The RTP is commercially available, except that what Y-12 uses will, by necessity, be of a somewhat different design than what the drug manufacturers use," Robinson said.

Rodney Smith of Y-12 Containment Technology said the RTP will be used in conjunction with glovebox "pods" that each will be discrete functions in the manufacturing process.

A company in Morgan County is manufacturing the mock-up that will be tested at Y-12 to determine how well the system will work. Alexander and Associates, a local engineering firm, assisted with the mock-up design.

"We have a schedule to begin testing in July. We plan to use the prototype with mock-ups to give the operators and others the chance to see how this is going to work. We want to be sure it is going to provide the material transfer capability and worker protection that we want at Y-12," Smith said.

The work on bringing the RTP to Y-12 is a joint effort of Operations, Technology Development, Engineering, Campaigns and Project Management under the newly formed SMC directorate.



The rapid transfer port will help reduce exposure hazards in future beryllium operations.

## Reynolds provides support, guidance for those coping with beryllium exposure

Russ Reynolds came to Y-12 last year to replace Howard Friedman as the site's psychologist. One of the responsibilities he assumed from Friedman was coordinating and facilitating the Beryllium Support Group. Having previously coordinated a support group for combat veterans with post-traumatic stress disorder from being exposed to Agent Orange and other chemicals, Reynolds was prepared for the mix of emotions he would encounter with the group. He was not prepared, however, for the number of group members.

"The group averages between 25 and 30 attendees every session," said Reynolds. "Some of them wouldn't miss it because it provides a strong sense of camaraderie."

Sessions are held every other Thursday in the Visitor Center conference room for the group that was formed shortly after the first case of chronic beryllium disease was diagnosed in 1992. The number of individuals known to have CBD and those with beryllium sensitization has grown to some 200 individuals in Oak Ridge and includes people from all three sites. Reynolds said that not all of these individuals attend the support group meetings partly because they are at different stages with their acceptance and coping with the condition.

"Accepting the fact that you have CBD follows the same path as any grieving process—there is anger, denial and other stages until there finally is acceptance," said Reynolds. "The challenge with this situation is that you have a disease that you didn't ask for, so it's tough to disconnect from the anger and move on to the other stages. Some people that have been diagnosed are in denial and won't come to the meetings. Others no longer attend because they have moved on and are learning to self-manage the disease and maximize the quality of their lives. I try to promote the notion that this disease, regardless of how you got it, does not have to remain the center of your life."



Reynolds

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## Hurst uses skills, ingenuity and tenacity to run surveillance program



Hurst

Having a “heart as big as Texas” is an accurate description for Houston native Debbie Hurst. She is the registered nurse in Y-12’s Occupational Health Services who oversees the Beryllium Medical Surveillance Program, and she is devoted to helping employees with beryllium sensitivity and chronic beryllium disease.

“I asked to set up the program last August when 10 CFR 850 went into effect because I wanted a challenge. Boy,

did I get one!” she said. “This program wasn’t already set up anywhere so that I could copy it, so I had to interpret the regulation, and I received lots of input on it. It was still very confusing. I would have given up, but I went to a beryllium support group meeting, and I was hooked.”

Hurst has spent her time since last summer working to create a program where employees with beryllium sensitivity and CBD can receive the medical attention they need. She also provides something the participants in the program find equally important—someone who can help them plow through the reams of paperwork that is required to fund their visits.

By working closely with Jim Elliott’s legal staff, Hurst has been able to direct individuals to appropriate funding for doctor visits and treatments. “Jim Elliott has been wonderful,” said Hurst. “He told me that the company will make sure these people get the treatment that they are entitled to under the regulation because that’s our responsibility.

“When I asked him if I could go into Oak Ridge and work out arrangements with Dr. Charles Bruton, a pulmonary specialist who sees the majority of the people here, Jim told me to go ahead. As a result, Dr. Bruton has told us that he will see patients

and work out the fee arrangements directly with the Department of Labor compensation program, which has taken a huge burden off of these folks.

“My job is to help get these folks what they need and get them protected,” said Hurst. “Before this program, many of them felt that no one was trying to help them, but no one was here that could devote this kind of time toward getting their problems solved.”

Hurst said she wishes she could educate everyone at Y-12 about beryllium. By bringing in material she has printed off the Web and combining it with a training video from Los Alamos, Hurst is opening the eyes of management and employees one at a time.

“I have to counsel all new entrants into the program and their supervisors,” she said. “Most of them—supervisors and employees—have told me, ‘Thanks, no one has ever explained this to me.’”

If you would like to have more information concerning beryllium sensitivity, CBD or the Beryllium Medical Surveillance Program, contact Hurst at 574-3897 or send an e-mail to [2dh@y12.doe.gov](mailto:2dh@y12.doe.gov).

## Reynolds

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Reynolds ensures the group has ample time to discuss their concerns with each other and visitors who can offer information and guidance. While Reynolds has been working to achieve a level of trust with the group, some of the visitors have made strides in creating trust between the company and the group.

“Dr. Reynolds invited Buddy Conner (Deputy Manager for Operations) to our meeting,” said Jesse McDonald, a group member who has CBD. “We explained to him that we shouldn’t have to be certified by a doctor every month to qualify for FMLA (Family and Medical Leave Act) because it’s not as if we’re ever going to get better. That’s a waste of our time and the doctor’s time. He said he’d look into getting something done, and we thought, ‘Oh yeah, sure you will,’ but at the next meeting Jim Elliott of Legal showed up and told us Buddy had asked him to speak with us about our problems. I have to admire him for sticking to what he said he would do.”

While some members of the group have gone outside of Oak Ridge and created relationships with other support groups at Rocky Flats, Hanford, Los Alamos and private groups in Ohio, most are content with the fellowship of the Oak Ridge group.

“Yeah, we get frustrated and fuss about our problems sometimes,” said McDonald. “But then we do things like go to Shoney’s and eat together. I know that sounds like a bunch of kids, but until you have this disease, you can’t say how it feels.”

# Understanding the legalities—Y-12 General Counsel explains the rules

By Jim Elliott, General Counsel

The health problems of beryllium workers present some of the toughest legal questions I've had to deal with since I arrived at Y-12. I'm still not an expert on the intricate web of laws and regulations that deal with beryllium workers, but I am trying, one question at a time, to give fair, legally correct answers and solutions. Here's a quick summary of pertinent laws and regulations.

The federal law entitled ***Energy Employees Occupational Illness Compensation Program Act (42 U.S.C. 7384)*** addresses beryllium sensitivity and chronic beryllium disease. Under that act those who are beryllium sensitive (and meet the other requirements of the act) are entitled to medical monitoring. Those with CBD also are entitled to compensation directly from the federal government and follow-up care.

**10 CFR 850 (Chronic Beryllium**

**Disease Prevention Program)** also addresses medical monitoring for those who are beryllium sensitive and care for those who have CBD. 10 CFR 850 also addresses rules regarding the obligation of the employer to offer beryllium-sensitive and CBD employees the right to "opt out" of work areas involving exposure to beryllium.

**Tennessee Worker's Compensation Law** entitles employees with occupational diseases, such as CBD, to compensation to the extent they can prove a temporary or permanent partial or total occupational disability resulting from the disease.

Each of these laws or regulations must be interpreted in conjunction with the unique facts of each case. That's where things get complicated.

Some employees want to know why beryllium sensitivity is not dealt with under Worker's Compensation. Beryllium sensitivity is not

a disease or injury as defined by the state compensation law. Only the occupational disease CBD qualifies under Worker's Compensation. In that way EEOICPA and Worker's Compensation are consistent. This has left us with some difficult questions as to how to make sure employees with beryllium sensitivity don't have to pay copays or deductibles for medical surveillance. We are working with the Department of Labor on this issue, because DOL is required to fund EEOICPA, which includes the stipulation for medical surveillance. I think the greatest frustration for employees is the time it takes to implement a law or regulation so that all runs smoothly. Congress passes laws every day, but implementing them takes time.

Another area of concern has been the ability of an employee with beryllium sensitivity or CBD to opt out of working in a beryllium area.

Some people are concerned that if they opt out they will be terminated. That is incorrect. The rules are complex, but the following is a brief, somewhat oversimplified summary: Workers who qualify for the opt-out must be given transfer to a comparable position that is available or becomes available, for which they are qualified or can quickly become qualified, and where beryllium exposures are below the "action" level; or *if this is not possible*, two years at the same pay grade, seniority, etc.

BWXT Y-12 values the service of its employees and will try its best to treat opt-out employees fairly and in the best interests of both the company and the employee. These are some of our most experienced employees, who usually carry clearances. There are often other things they can be trained to do that would benefit both the company and the employee.

## Moore wishes others would educate themselves about CBD to avoid intolerance

Phyllis Moore always has worked a desk job during her tenure at K-25, ORNL and Y-12. The only time she ever went into the field was to audit and inventory material storage vaults, labs and production facilities, as well as tag capital equipment that was being stored. She thinks that it was in the field that she came into contact with beryllium.

"When I was at K-25, I was having respiratory problems, but because I didn't work in any of the shops, they didn't check me for beryllium disease," said Moore. "Instead, I was diagnosed with sarcoidosis and given steroids to help with it. At the time, I never thought about going into those buildings to tag equipment, but in hindsight, I can see how I was exposed to beryllium. I complied with all the personal protective equipment requirements when I went into those buildings, but they didn't know as much then as they do now about beryllium and its effects."

When Moore's respiratory conditions worsened, doctors began to speculate on other possible illnesses. "They thought I might also have lupus or asthma along with the sarcoidosis," she said. "I was just hoping that they'd narrow it down to one thing because having all those illnesses sounded awful."

In May 2001, Moore took a beryllium lymphocyte proliferation test, or LPT, as part of the Paper, Allied-Industrial, Chemical and Energy workers' medical evaluation program. With the first test coming back positive, she took another in July, which also showed positive. From these results, Moore

was directed by Y-12 medical personnel and Oak Ridge Institute for Science and Education personnel to Dr. Charles Bruton, an Oak Ridge pulmonary specialist who treats a large percentage of chronic beryllium disease patients. Bruton took biopsy pieces from her lungs in October to further confirm her condition.

"I wish people understood this disease so they could be more understanding about what I am dealing with. I don't know if I'll get worse, but I do know I'm never getting well."

—Phyllis Moore

her chest to heave and burn from walking the short distance from her office to the parking lot, she also suffers from joint pain and muscle stiffness. Moore said she finds it discouraging when she has to sit down or nap because she has limited blood oxygen flow in her body.

Moore said she is comforted by her faith, and she looks for blessings in every aspect of her life. "I think it was fortunate that I was previously diagnosed with a disease that called for the same treatment as chronic beryllium disease," she said. "I'm also glad that I now know what I'm suffering from because if I hadn't taken the LPTs and confirmed that I have CBD, they would still be looking for an answer. I think not knowing what made you sick would be much worse."

"I really didn't even know what beryllium was, and I never considered beryllium as harmful as asbestos, uranium or nickel," said Moore. "I knew there were risks in working at the sites, but I thought I was safe. This has really turned my life upside down."

Moore said she has noticed that her life is "slowing down." Besides having limited respiratory function that causes

## McDonald finds mental aspects of CBD as tough as physical ones



McDonald

### The past that haunts him

Jesse McDonald last worked in the west end of Y-12 in 1971, but he has carried part of his former job with him ever since. Tiny particles of beryllium have remained in McDonald's lungs and, because of his genetic makeup, have left him with chronic beryllium disease.

"There were no policies or plans on how to handle that stuff back then," said McDonald. "We wore respirators they kept in a big can—they didn't fit them for you like they do now. We used to shake beryllium out of our clothes when we got done working in it."

### Testing for beryllium

McDonald can recite to you the history of beryllium policy making. He can recall when former Department of Energy Secretary Fredrico Peña called for the use of Best Defense Practices that eventually led to DOE regulation 440.1, which required classroom training and offered medical surveillance for beryllium workers. The surveillance consisted of a breathing test, an X-ray and a beryllium lymphocyte proliferation test (commonly known as an LPT). After McDonald had reluctantly gone through this surveillance program, he received a letter from former Y-12 Medical Director Dr. Buck Jones.

"He said my first LPT was positive and that I should have a second one done to confirm the test results," said McDonald. "When the second one came back positive, it was like a car came down on me."

After being referred to the Oak Ridge Institute for Science and Education, the agency that handles the LPTs, for further evaluation, McDonald was sent to a pulmonary specialist at Park West in Knoxville. The specialist sent him to Vanderbilt University in September 1998 for a two-day test that included a bronchial lavage, a procedure that involved pouring saline solution into McDonald's lungs and suctioning it out and checking it for beryllium particles. Five biopsy pieces of his lungs also were taken and sent to two different labs. Their findings came back December 18.

### Holding off the truth

"I told myself that it was a week before Christmas and there was no sense in spoiling my holiday," said McDonald. "So I waited, but then New Year's came, and I told myself that I should just enjoy my vacation time."

It wasn't until mid-January when McDonald decided to open the letter. He did it during a beryllium support group meeting that featured a visit from Dr. Lee Newman of the National Jewish Center for Immunology and Respiratory Medicine in Denver. Newman is considered one of the most knowledgeable physicians in the field of CBD from his work with Rocky Flats plant workers. Taking advantage of an opportunity to speak with Newman one-on-one after the

meeting, McDonald showed him the letter.

"He said, 'You can drop the word probably in here about your diagnosis—you've got it,'" said McDonald. "That's when the mental part set in. They say you have to go through a cycle of grieving when something like this happens, but I haven't gotten to the end of it yet. I don't know if I ever will. It's tough to know you have something there is no cure for."

### The thought of breathing bottled air

When policy 10 CFR 850 recently went into effect, McDonald took advantage of the clause that says you can get a second opinion from another physician about the disease. McDonald chose to go to Jewish Medical Center and visit Dr. Newman. After many tests, Newman determined that McDonald's respiratory function had dropped to only 70 percent of what it should be. "The plane ride home was the longest flight I've ever taken," he said.

To put what McDonald refers to as "a little bit of brakes" to his deteriorating breathing condition, he attends Chronic Obstructive Pulmonary Disease therapy three times a week. Seeing other pulmonary patients at his therapy existing only through the use of bottled oxygen brings a depressing reminder to McDonald as to what his future might hold.

### Time to think about things

He cannot sleep more than 45 minutes at a time now without the aid of a breathing machine. With all of his children grown, McDonald has plenty of time alone to think about things.

"When I leave here on Fridays, I might stop at Krogers or Wal Mart, but then I park my car in my driveway, and it doesn't leave that spot until Monday morning," he said. "Having this disease is depressing as hell."

## Numbers to know . . .

- Occupational Medical Services Clinic (to schedule beryllium testing) 574-1577
- Beryllium Medical Surveillance Program (for all new beryllium-area workers) 574-3897
- Beryllium Support Group (Russ Reynolds) 574-3434
- Industrial Hygiene Organization 576-7182 or 576-7180
- Energy Employees Compensation Resource Center (Dept. of Labor compensation office) 481-0411 or 1-866-481-0411
- Paper, Allied-Industrial, Chemical and Energy Union (beryllium testing for former K-25, Paducah and Portsmouth employees) 1-888-241-1199, 481-3394 or 481-3395



# Maintenance stand down in Building 9204-4: A first for Y-12

For the folks in 9204-4, it was all in nine days' work.

Earlier this year, the 9204-4 facility performed a planned, operational stand down during which all inspection, utilities and fire protection activities and all corrective and preventive maintenance due this year were completed in nine days.

It was a team effort between the service provider organizations within Facilities, Infrastructure and Services and the Assembly Organization within Manufacturing. The stand down was regarded as a "huge success" by Y-12 management, according to Pat Fortune, Assembly Organization manager.

### Increased efficiency

The significance of the stand down goes beyond the sheer effort of being able to accomplish all of these activities in nine days. It also reduced the amount of duplicate planning necessary, limited planned shut downs to one week, provided an elevated level of readiness, and increased the efficiency for operations and the service provider organizations.

National Nuclear Security Administration technical experts who were on-site during the

stand down were "very satisfied" with the results of the effort.

This was the second stand down for the 9204-4 facility. Last year, the facility volunteered to pilot an effort to complete all annual inspections within a limited, scheduled time frame.

This year, the maintenance stand down in 9204-4 was expanded significantly. All crane preventive maintenance and inspections, a large number of maintenance jobs, correction of a number of fire systems discrepancies, all fire system operational safety requirement surveillance and two 5-year, PM activities were completed.

### Replacements and inspections

Forty-five 450-volt breakers were replaced, and the PM on the 13.8-kilovolt breakers and transformers was performed by Power Operations. In addition, all elevator PM and inspections were completed, and all heating, ventilating and air conditioning filters were changed.

Perhaps most significantly, during a full day's power outage, the criticality accident alarm system fault relays were electronically removed from the CAAS fault circuit and replaced. The full day's power outage required the greatest

planning (because of the loss of automatic safety systems), but it increased the assurance that the relays were replaced on schedule.

A six- to eight-week planning effort was coordinated by Facilities, Infrastructure and Services prior to the outage. Rob Hughes, building shift manager, who led the execution of the stand down, summed up the keys to their success. "It required the involvement and dedication of many people from across the site, including Manufacturing, Quality Evaluation, and service provider organizations," Hughes said.

### Exceeding expectations

"All participants remained focused and did a superb job. Through their efforts, the accomplishments exceeded the expected results." Hughes also noted that "it was an outstanding example of Integrated Safety Management in action," utilizing the ISM process to reduce multiple activities spanning a full year to a concentrated effort within a week.

Hughes and the team highly recommend this type of stand down to other facilities. Anyone interested in pursuing this activity or who might have questions can contact Hughes at 241-2488 or Beth Schaad at 241-2566.



## Don't get bent out of shape by a strain or sprain

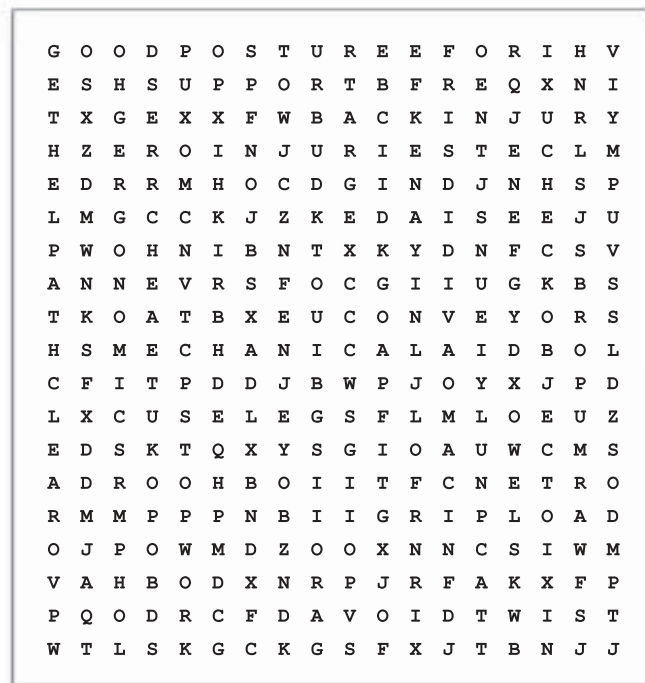
Historically, during the month of May, Y-12 has a lot of strain and sprain injuries due to overexertion and repetitive movements. While no one knows for certain why this happens, we do know that strains and sprains can be prevented.

Strains and sprains are traumatic injuries to muscles, tendons, ligaments and joints resulting from sudden wrenching, twisting, stretching and ripping. Strains and sprains occur from falls, slips, trips and contact with objects. However, overexertion is the major cause of most strains and sprains.

To avoid strain/sprain injuries, ask yourself:

- Is this too heavy?
- Should I use mechanical assistance or the help of a co-worker?
- Is my body in an awkward position for this task?
- Is there a safer way to perform this job?
- Should I rotate job tasks to avoid a strain?

Strains and sprains are the leading category of injury among nonfatal occupational injuries and illnesses. It is important that each person knows his or her physical limitations and works within those limits.



Find the safety-related words in the puzzle.

- |              |                |               |
|--------------|----------------|---------------|
| avoid twist  | ESH support    | path clear    |
| back injury  | exercise       | plan lift     |
| body motion  | fitness        | stop work     |
| check object | get help       | training      |
| conveyors    | good posture   | use legs      |
| design       | grip load      | warm up       |
| ergonomics   | mechanical aid | zero injuries |

# Bargaining-unit employees—act safely now for your award!

Did you know that you can make extra money just by working safely? You can if you are one of the more than 1,400 bargaining-unit employees at Y-12.

“How is this possible?” you ask. Through a limited-time offer from the Atomic Trades and Labor Council, you can make up to \$167 just by demonstrating safe work practices individually and in your work group. Want to know more? Just listen to ATLC’s Y-12 Vice-President Earl Johnson describe the simple strategy behind the success of the program.

“This is the first time the ATLC has been able to make an offer like this. But we know that by working safely one day at a time, everyone is going to benefit from it. Just by keeping yourself or your buddy off the list of hourly lost workday away cases, you’re proving that safety means something to you. Before you know it, the program will be completed, and everyone will be safe, happy and richer.”

The program works on a tier model with higher rewards for improved performance. The tiers are based on improvements over last year’s lost workday accident case (LWAC) rate by percentage. The target improvement for the program is a 40 percent reduction in LWACs. If the goal is met, you get \$60. It’s so easy!

Want to add another \$40 to that total to make an even \$100? Each accident-free employee is eligible for \$10 quarterly personal recognition awards. Combined with the \$60 percentage reduction award, employees can amass \$100 in safety award money.

## Wait! There’s more.

If the Y-12 hourly employee population achieves the “super-target” of a 55 percent reduction in LWACs, an additional \$67 per person will be awarded. That brings the total possible award to \$167 for each employee.

“Can it be done?” you ask. Y-12 Pipefitters Chief Steward and program leader David Castleberry explains the details.

“Last year’s total of lost workday away cases was 35. By reducing that number by just 14, the LWACs drop by 40 percent. During the first two quarters of this fiscal year, there have been only three hourly LWACs. If we maintain that rate, the total for the year would be six LWACs. That would be an 87 percent reduction from last year. That’s good enough to get every incentive clause in the program: the \$60 base award, the \$40 personal incentive award and the bonus \$67 for beating the super-target!”

## That’s not all!

For all those participating in the Hourly Safety Award program, a jacket of your color choice emblazoned with the striking Y-12 logo will be included in this incredible offer.

“Can all this be true?” you ask. Just ask Johnson or Castleberry during one of the Tool Box meetings they are holding throughout Y-12. Hear them explain that safety is not a priority but a value because priorities can change from hour to hour.

Be assured by their confidence that a safety value is embedded and will not be compromised. What are you waiting for? Call 241-3200 today and schedule your Tool Box meeting.

If all these prizes aren’t enough, you also can enjoy the guaranteed satisfaction of being able to go home each day uninjured to your families and friends. This portion of the offer does not have any time limits on it—you can take advantage of it every day just by being safe at Y-12.

*This program has received the full approval and funding of BWXT Y-12 President and General Manager John Mitchell. Offer good only in the state of Tennessee at the Y-12 National Security Complex.*



Win one of these attractive jackets shown here by ATLC Y-12 Vice- President Earl Johnson and Joyce Disney.

## BWX TYmes

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Address correction requested

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